System and Method for Formatting Electronic Messages From a Mobile Communication Device

FIELD

The technology described in this patent document relates generally to the field of electronic messaging systems. More particularly, the patent document describes a system and method for formatting electronic messages from a mobile communication device.

BACKGROUND

Electronic messaging systems that can redirect electronic messages to and from a mobile communication device are known. In such electronic messaging systems, the mobile communication device may be associated with an electronic messaging account within the electronic messaging system. Electronic messages sent from the electronic messaging account are typically formatted using either default settings or formatting preferences established by the account holder. A preferred message format for outgoing electronic messages may typically be configured by an account holder from a desktop client. For example, an account holder may typically set font size, font color, font type and/or other message format characteristics from the desktop client associated with an electronic messaging account. When an electronic message is composed at the desktop client, the message is sent from the electronic messaging account using the default settings or the message format preferences. However, the message format used for messages composed at the desktop client is not typically applied to messages sent from an associated mobile communication device. Thus, an electronic message composed at the mobile communication device may be formatted differently than messages sent from an associated desktop client. For example, a message from the mobile communication device may be

formatted using a plain text format while messages from the desktop client may include different font types, colors or sizes.

SUMMARY

Systems and methods are provided for formatting electronic messages from a mobile communication device. An electronic messaging system may be used that is operable to send and receive electronic messages and to redirect electronic messages to and from a mobile communication device that is associated with an electronic messaging account in the electronic messaging system. Upon receiving an electronic message for redirection from the mobile communication device, the electronic messaging system may be operable to identify a message format for the electronic message, reformat the electronic message using the identified message format, and redirect the reformatted message for delivery. The identified message format may be used for both electronic messages sent from the mobile communication device and for electronic messages sent from a desktop client associated with the electronic messaging account.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing an example system and method for formatting electronic messages from a mobile communication device;

Fig. 2 is a block diagram showing an example system and method for formatting reply messages from a mobile communication device;

Fig. 3 is a block diagram showing an example system and method for formatting forwarded messages from a mobile communication device;

Fig. 4 is a block diagram of an example system for redirecting electronic messages to and from a mobile communication device; and

Fig. 5 is a block diagram of an example mobile communication device.

DETAILED DESCRIPTION

With reference now to the drawing figures, Fig. 1 is a block diagram 10 showing an example electronic messaging system 14 for formatting electronic messages from a mobile communication device 12. The electronic messaging system 14 includes at least one electronic messaging account 18 and a storage medium 20 for storing message format data 20. Also illustrated are a remote electronic messaging account 16 and one or more communication networks 22.

The electronic messaging system 14 may be operable to send and receive electronic messages between electronic messaging accounts 16, 18 and redirect electronic messages to and from the mobile communication device 12. The electronic messaging accounts 16, 18 may, for example, be maintained by electronic messaging software executing on one or more mail servers. The electronic messaging accounts 16, 18 may be included in separate electronic messaging systems (as illustrated) or may be included within the same electronic messaging system 14. The electronic messaging accounts 16, 18 may, for example, operate with associated desktop clients to send and receive electronic messages. The message format data 20 may, for example, be configured by the account holder using a desktop client and stored in an email account database associated with the electronic messaging account 18. An example electronic messaging system 14 is described below with reference to Fig. 4.

The communication networks 22 may include one or more computer networks, such as a wide area network, and one or more wireless communication networks. For example, the remote electronic messaging account 16 may communicate with the electronic messaging system 14 via a wide area computer network, such as the Internet. The mobile communication device 12 may, for example, communicate with the electronic messaging system 14 via both a wide area computer network and a wireless communication network.

In operation, the electronic messaging system 14 formats outgoing electronic messages using the stored electronic message format data 20 such that electronic messages sent from the mobile communication device 12 are formatted the same as electronic messages sent from the associated electronic messaging account 18. For example, a first electronic message 24 may be composed at the mobile communication device 12 using a first message format (MF_A) and addressed to the remote electronic messaging account 16. The electronic message 24 from the mobile communication device 12 is sent over the network(s) 22 to the electronic messaging system 14, which reformats the electronic message 24 using the message format data 20. The reformatted message (MF_B) 26 is then redirected over the network(s) to the remote electronic messaging account 16. Similarly, an electronic message 28 sent from the electronic messaging account 18 (e.g., composed at a desktop client) is formatted using the message format data 20 and delivered to the remote electronic messaging account 16 over the network(s) 22. In this manner, electronic messages 26, 28 sent to the remote electronic messaging account 16 from either the mobile communication device 12 or the associated electronic messaging account 18 will have the same message format (MF_B).

Fig. 2 is a block diagram 30 showing an example electronic messaging system 14 for formatting reply messages from a mobile communication device 12. This example 30 is similar

to the example system and method illustrated in Fig. 1, except that the electronic message 34 sent from the mobile communication device 12 is a reply to a message 32 received from the remote electronic messaging account 16.

In a typical electronic messaging system, a reply message sent from a desktop client is often formatted using the same message format as the received message. For example, if a message is received at the electronic messaging account 18 having a message body formatted using a Courier font, then a reply message from the electronic messaging account 18 (e.g., a message created by selecting the reply function at the desktop client) will typically automatically be formatted using the same Courier font. The system and method shown in Fig. 2 extends this automatic formatting process to reply messages from the mobile communication device 12.

The message format data 20 may identify a format to be used by the electronic messaging system 14 for reply messages from both the electronic messaging account 18 and the associated mobile communication device 12. For example, the message format data 20 may instruct the electronic messaging system 14 to format all reply messages using a message format from the original message 32 (i.e., the message being replied to). The message format of the original message 32 may, for example, be identified by the electronic messaging system 14 using metadata, such as a content type field, within the message 32. Alternatively, the message format data 20 could be configured (e.g., by the desktop client) to format reply messages from the electronic messaging account 18 and the mobile communication device 12 in some other uniform manner.

In the example of Fig. 2, an electronic message 32 formatted using a first message format (MF_A) is addressed to the electronic mail account 18 and delivered to the electronic messaging system 14 over the network(s) 22. The electronic messaging system 14 then delivers the

received message 32 to the identified electronic messaging account 18 and also redirects a copy of the message 32 over the network(s) 22 to the mobile communication device 12. (See, e.g., Fig. 4). If a reply message 38 is sent from the electronic messaging account 18 (e.g., composed by the desktop client), then the electronic messaging system 14 accesses the message format data 20 and formats the reply message 38 using the identified message format (MF_A). Similarly, if a reply message 34 is sent from the mobile communication device 12, then the electronic messaging system 14 accesses the message format data 20 to determine the proper format, and reformats the reply message 36 accordingly. For example, the message format data 20 may instruct the electronic messaging system 14 to format reply messages 36, 38 from both the mobile communication device 12 and the electronic messaging account 18 using the same messaging format (MF_A) as the received message 32.

Fig. 3 is a block diagram 40 showing an example electronic messaging system 14 for formatting forwarded messages from a mobile communication device 12. This example 40 is similar to the example systems and methods of Figs. 1 and 2, except that the electronic message 48 sent from the mobile communication device 12 was received from a first electronic messaging account 42 and forwarded to a second electronic messaging account 44.

Similar to a reply message, a forwarded message is often formatted in a typical electronic messaging system using the same message format as the received message. A forwarded message typically includes all or part of the received message and may also include additional message text, attachments, etc. For example, if a message is received at the electronic messaging account 18 formatted with a Courier font type, then typically the same Courier font type will be automatically used for any additional message text included in a forwarded message from the

electronic messaging account 18. The system and method show in Fig. 3 extends this automatic formatting process to forwarded messages from the mobile communication device 12.

The message format data 20 may identify a format to be used by the electronic messaging system 14 for forwarded messages from both the electronic messaging account 18 and the associated mobile communication device 12. For example, the message format data 20 may instruct the electronic messaging system 14 to format all forwarded messages using a message format from the original message 46. The message format of the original message 46 may, for example, be identified by the electronic messaging system 14 from metadata within the message 46 (e.g., a content type field). Alternatively, the message format data 20 may be configured (e.g., by the desktop client) to format forwarded messages from electronic messaging account 18 and the mobile communication device 12 in some other uniform manner.

In the example of Fig. 3, an electronic message 46 having a first format (MF_A) is addressed to the electronic messaging account 18 and delivered to the electronic messaging system 14 via the network(s) 22. Upon receiving the message 46, the electronic messaging system 14 places the message 46 into the electronic messaging account 18 and also redirects a copy of the message 46 over the network(s) 22 to the mobile communication device 12. (See, e.g., Fig. 4). If a forwarded message 52 is sent from the electronic messaging account 18 (e.g., composed by the desktop client), then the electronic messaging system 14 accesses the message format data 20 and formats the forwarded message 52 using the identified message format (MF_A). Similarly, if a forwarded message 48 is sent from the mobile communication device 12, then the electronic messaging system 14 accesses the message format data 20 to identify the message format, and reformats the forwarded message 52 accordingly. For example, the message format data 20 may instruct the electronic messaging system 14 to format forwarded

messages 50, 52 from both the mobile communication device 12 and the electronic messaging account 18 using the same messaging format (MF_A) as the received message 46.

Fig. 4 is a block diagram of an example system 300 for redirecting electronic messages to and from a mobile communication device 320. The example redirection system 300 includes an enterprise server 304, a mail server 302, a storage medium 306 for electronic messaging (email) account data, and a wireless gateway 316. Also illustrated are the mobile communication device 320, a wireless network 318, a wide area network (WAN) 312, a firewall 310, a desktop client 308, and one or more other electronic messaging systems 314.

The mail server 302 may include electronic messaging software executing on a computer within a local area computer network (LAN). The mail server 302 is coupled to local network devices 304, 306, 308 via the LAN, and is coupled to remote network devices 314, 316 via the WAN 312. The LAN and WAN 312 may be separated by a firewall 310.

The mail server 302 maintains an electronic mail (email) account within the email account database 306 for each desktop client 308 in the LAN. The email account database 306 may be one or more storage devices coupled to the mail server 302, and may be included within the same network device as the mail server 302 or in one or more separate devices within the LAN. The desktop client 308 may be one of a plurality of computers (e.g., personal computers, terminals, laptop computers, or other processing devices) coupled to the mail server 302 via the LAN that execute electronic messaging software to send and receive electronic messages (email) via the mail server.

Electronic messages sent from the desktop client 308 are stored by the mail server 302 in an outgoing message storage location (an "outbox") within a corresponding email account 306. If the outgoing message is addressed to an email account within the LAN, then the mail server

302 delivers the message to an incoming message storage location (an "inbox") in the appropriate email account 306. If the outgoing message is addressed to an email account in another electronic messaging system 314, however, then the message is delivered via the WAN 312. Similarly, incoming electronic mail (email) addressed to the email account 306 is received by the mail server 302 and stored to the email account database 306 within the appropriate incoming message storage location ("inbox"). The incoming email may then be retrieved from the email account 306 by the desktop client 308, or may be automatically pushed to the desktop client 308 by the mail server 302.

The enterprise server 304 may include electronic mail (email) redirection software executing on a computer within the LAN. The enterprise server 304 is operational to redirect electronic mail messages (email) from the email account 306 to the mobile communication device 320 and to place messages sent from the mobile communication device 320 into the email account 306 for delivery by the mail server 302. The enterprise server 304 stores mobile device information, such as a wireless identification (e.g., a PIN), used to communicate with the mobile communication device 320. The enterprise server 304 may, for example, communicate with the mobile communication device 320 using a direct TCP/IP level connection with the wireless gateway 316, which provides an interface between the WAN 312 and the wireless network 318.

When an electronic message (email) is received in the inbox of the email account 306, the email is detected by the enterprise server 304, and a copy of the message and any necessary mobile device information are sent over the WAN 312 to the wireless gateway 316. For example, the enterprise server 304 may encapsulate a copy of the message into one or more data packets along with a wireless identification (e.g., a PIN) for the mobile communication device 320, and transmit the data packet(s) to the wireless gateway 316 over a direct TCP/IP level

connection. The wireless gateway 316 may then use the wireless identification and/or other mobile device information to transmit the data packets(s) containing the electronic message over the wireless network 318 to the mobile communication device 320.

Electronic messages sent from the mobile communication device 320 may be encapsulated into one or more data packets along with a network identification for the enterprise server 304 and then transmitted over the wireless network 318 to the wireless gateway 316. The wireless gateway 316 may use the network identification for the enterprise server 304 to forward the data packet(s) over the WAN 312 to the enterprise server 304, preferably via a direct TCP/IP level connection. Upon receiving the data packet(s) from the wireless gateway 316, the enterprise server 304 places the enclosed electronic message (email) into the outbox of the associated email account 306. The mail server 302 then detects the email in the outbox and delivers the message, as described above.

Security may be maintained outside of the firewall 310 by encrypting all electronic messages sent between the enterprise server 304 and the mobile communication device 320. For instance, an electronic message to be redirected to the mobile communication device 320 may be encrypted and compressed by the enterprise server 304, and the encrypted message may then be encapsulated into one or more data packets for delivery to the mobile communication device 320. To maintain security, the electronic message may remain encrypted over the entire communication path 316, 318, 312 from the enterprise server 304 to the mobile communication device 320. Similarly, electronic messages sent from the mobile communication device 320 may be encrypted and compressed by the mobile communication device 320 before being packetized and transmitted to the enterprise server 304, and may remain encrypted over the entire

communication path 316, 318, 312 from the mobile communication device 320 to the enterprise server 304.

In addition, the enterprise server 304 may include a communication subsystem, a memory subsystem and a processing subsystem. the communication subsystem may be operable to communicate with the wireless gateway 316 over the WAN 312. The memory subsystem may be operable to store data and program information. The processing subsystem may be operable to store and retrieve data in the memory subsystem and execute programs stored in the memory subsystem, and to cause the communication subsystem to transmit and receive information ver the WAN 312. The enterprise server 304 may also include a message formatting program stored in the memory subsystem and executed by the processing subsystem to perform the message formatting functions described herein.

Cross-referencing Figs. 1 and 4, electronic messages that are redirected from the mobile communication device 320 may be reformatted by the enterprise server 304 to match the format of electronic messages composed at the desktop client 308. Upon receiving an outgoing electronic message from the mobile communication device 320, the enterprise server 304 may access message format data 20 stored in the associated user account 306 and reformat the message before placing the reformatted message into the outbox of the email account 306 for delivery by the mail server 302. In this manner, electronic messages composed at the mobile communication device 320 may be delivered in the same format as messages composed at the desktop client 308.

Cross-referencing Fig. 4 with Figs. 2 and 3, reply messages and forwarded messages that are redirected from the mobile communication device 320 may be reformatted by the enterprise server 304 to match the format that would be used if the message where composed at the desktop

client 308. Upon receiving an outgoing electronic message from the mobile communication device 320, the enterprise server 304 may determine if the message is a reply message or a forwarded message. If the enterprise server 304 determines that the outgoing message is a reply or forward, then the enterprise server 304 may access message format data 20 stored in the associated user account 306 to determine the message format designated for reply messages or forwarded messages. For instance, the message format data 20 may designate that all reply messages and forwarded messages from either the mobile communication device 320 or the desktop client 308 be formatted using the message format from the original message. The enterprise server 304 may then reformat the outgoing message from the mobile communication device 320 using the designated message format and place the reformatted message into the outbox of the email account 306 for delivery by the mail server 302. In this manner, reply and forwarded messages composed at the mobile communication device 320 may be delivered in the same message format as if composed at the desktop client 308.

Fig. 5 is a block diagram illustrating an example mobile communication device 400. The mobile communication device 400 includes a processing subsystem 438, a communications subsystem 411, a short-range communications subsystem 440, a memory subsystem 424, 426, and various other device subsystems and/or software modules 442. The mobile communication device 400 also includes a user interface, which may include a display 422, a keyboard 430, a speaker 432, a microphone 436, one or more auxiliary input/output devices 428, a serial port 430, and/or other user interface devices.

The processing subsystem 438 controls the overall operation of the mobile communication device 400. Operating system software executed by the processing subsystem 438 may be stored in a persistent store, such as a flash memory 424, but may also be stored in

other types of memory devices in the memory subsystem, such as a read only memory (ROM) or similar storage element. In addition, system software, specific device applications, or parts thereof, may be temporarily loaded into a volatile store, such as a random access memory (RAM) 426. Communication signals received by the mobile communication device 400 may also be stored to RAM 426.

The processing subsystem 438, in addition to its operating system functions, enables execution of software applications 424 on the device 400. A predetermined set of applications that control basic device operations, such as data and voice communications, may be installed on the device 400 during manufacture. In addition, a personal information manager (PIM) application, including an electronic messaging application, may be installed on the device. The PIM may, for example, be operable to organize and manage data items, such as email, calendar events, voice mails, appointments, and task items. The PIM application may also be operable to send and receive data items via the wireless network 419.

Communication functions, including data and voice communications, are performed through the communication subsystem 411, and possibly through the short-range communications subsystem 440. The communication subsystem 411 includes a receiver 412, a transmitter 414 and one or more antennas 416, 418. In addition, the communication subsystem 411 also includes a processing module, such as a digital signal processor (DSP) 420 or other processing device(s), and local oscillators (LOs) 413. The specific design and implementation of the communication subsystem 411 is dependent upon the communication network in which the mobile communication device 400 is intended to operate. For example, a mobile communication device 400 may include a communication subsystem 411 designed to operate within the

Mobitex™ mobile communication system, the DataTAC™ mobile communication system, a GSM network, a GPRS network, a UMTS network, and/or an EDGE network.

Network access requirements vary depending upon the type of communication system. For example, in the Mobitex and DataTAC networks, mobile communication devices are registered on the network using a unique personal identification number or PIN associated with each device. In UMTS and GSM/GPRS networks, however, network access is associated with a subscriber or user of a device. A GPRS device therefore requires a subscriber identity module, commonly referred to as a SIM card, in order to operate on a GSM/GPRS network.

When required network registration or activation procedures have been completed, the mobile communication device 400 may send and receive communication signals over the communication network 419. Signals received by the antenna 416 from the communication network 419 are routed to the receiver 412, which provides signal amplification, frequency down conversion, filtering, channel selection, etc., and may also provide analog to digital conversion. Analog-to-digital conversion of the received signal allows the DSP to perform more complex communication functions, such as demodulation and decoding. In a similar manner, signals to be transmitted to the network 419 are processed (e.g., modulated and encoded) by the DSP 420 and are then provided to the transmitter 414 for digital to analog conversion, frequency up conversion, filtering, amplification and transmission to the communication network 419 (or networks) via the antenna 418.

In addition to processing communication signals, the DSP 420 provides for receiver 412 and transmitter 414 control. For example, gains applied to communication signals in the receiver 412 and transmitter 414 may be adaptively controlled through automatic gain control algorithms implemented in the DSP 420.

In a data communication mode, a received signal, such as a text message or web page download, is processed by the communication subsystem 411 and input to the processing device 438. The received signal is then further processed by the processing device 438 for output to a display 422, or alternatively to some other auxiliary I/O device 428. A device user may also compose data items, such as email messages, using a keyboard 438 and/or some other auxiliary I/O device 428, such as a touchpad, a rocker switch, a thumb-wheel, or some other type of input device. The composed data items may then be transmitted over the communication network 419 via the communication subsystem 411.

In a voice communication mode, overall operation of the device is substantially similar to the data communication mode, except that received signals are output to a speaker 434, and signals for transmission are generated by a microphone 436. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, may also be implemented on the device 400. In addition, the display 422 may also be utilized in voice communication mode, for example to display the identity of a calling party, the duration of a voice call, or other voice call related information.

The short-range communications subsystem 440 enables communication between the mobile communication device 400 and other proximate systems or devices, which need not necessarily be similar devices. For example, the short-range communications subsystem 440 may include an infrared device and associated circuits and components, or a Bluetooth™ communication module to provide for communication with similarly-enabled systems and devices.

This written description uses examples to disclose the invention, including the best mode, and also to enable a person skilled in the art to make and use the invention. The patentable scope of the invention may include other examples that occur to those skilled in the art.